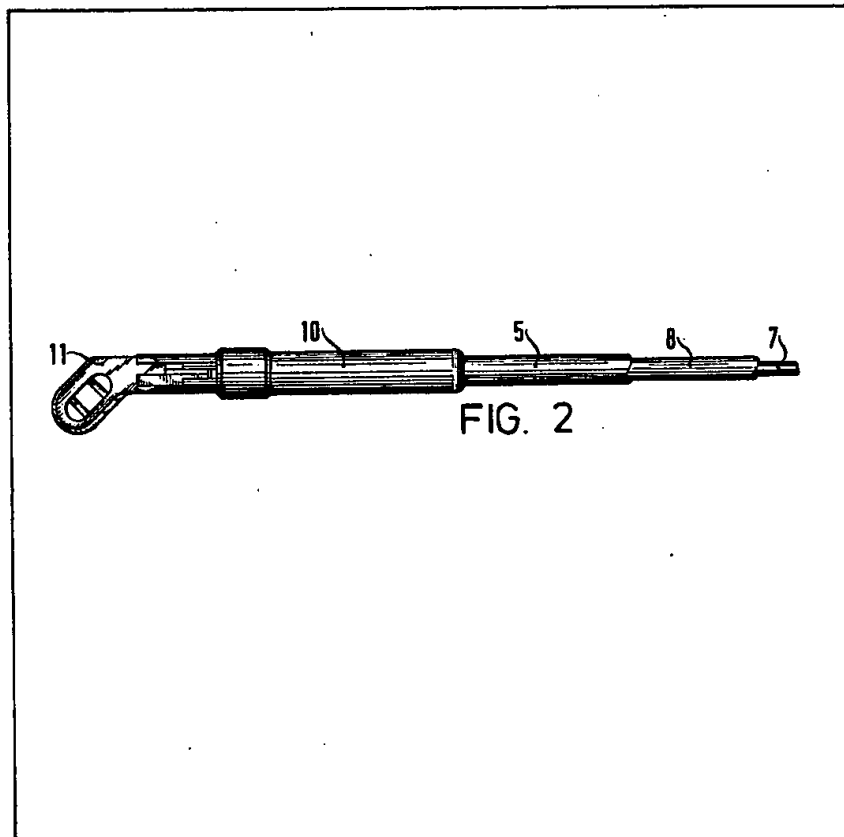
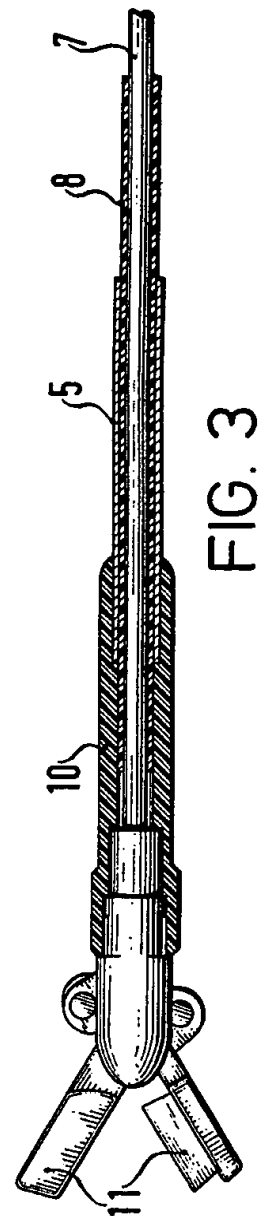
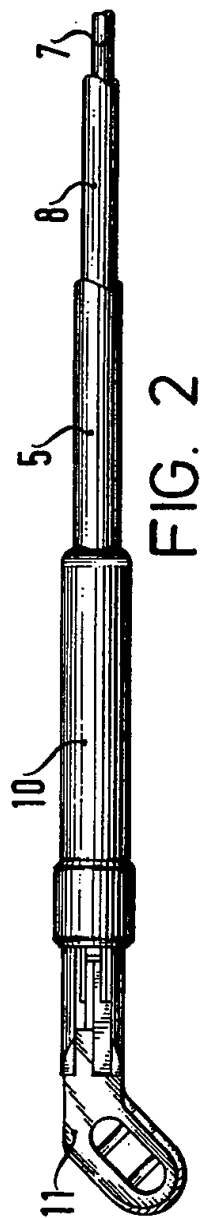
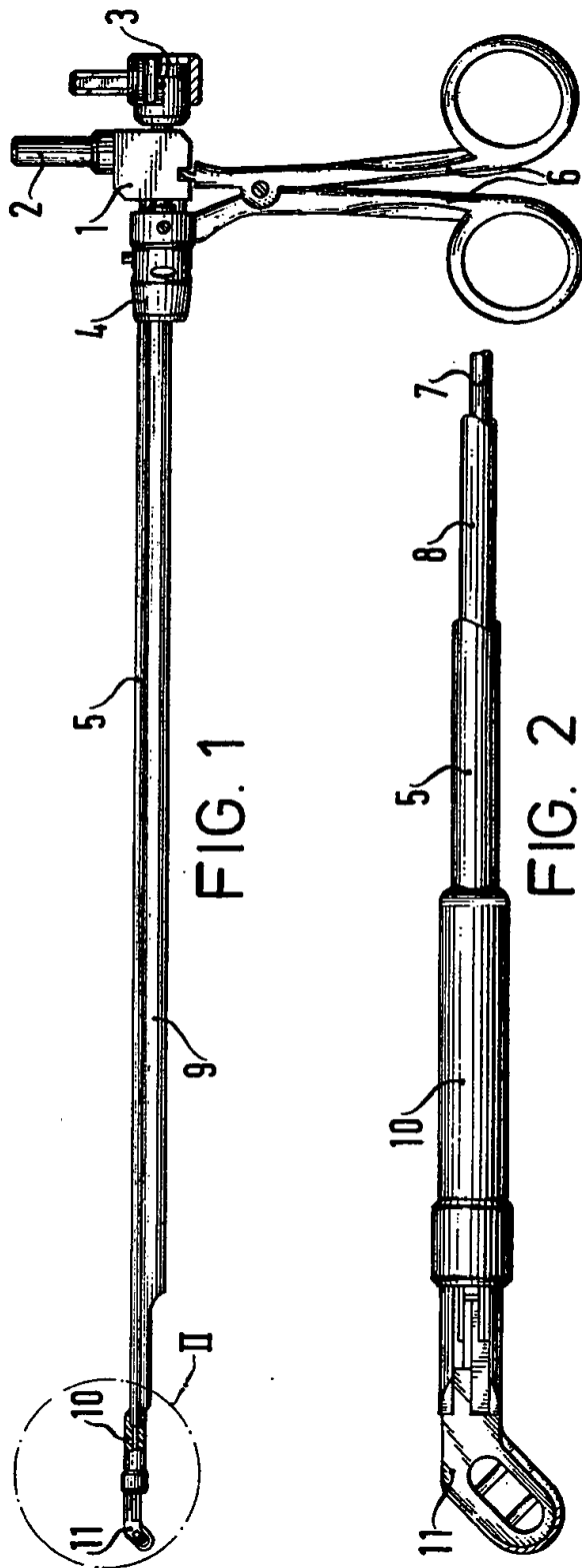


- (21) Application No 8324746  
(22) Date of filing 15 Sep 1983  
(30) Priority data  
(31) 8230264  
(32) 28 Oct 1982  
(33) Fed Rep of Germany (DE)  
(43) Application published  
10 May 1984  
(51) INT CL<sup>3</sup>  
A61B 10/00 17/39  
(52) Domestic classification  
A5R EW  
(56) Documents cited  
None  
(58) Field of search  
A5R  
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(54) Endoscopic instruments for  
sample-taking and cauterisation

(57) An endoscope through whose  
outer shaft extends a passage for  
traversal by an optical system and a  
shaft 5 by a sample-excision pair of  
forceps whose actuating rod 7 of the  
jaws 11 extend through the shaft 5 and is  
connectible to one terminal of an HF  
current source. The rod 7 is also  
surrounded by an insulating tube 8  
which terminates in a rigid cylindrical  
electrically insulating extension 10 of  
the shaft 5 and the distal end projects  
out of the outer shaft of the endoscope.





## SPECIFICATION

### Endoscopic instruments

5 The present invention relates to endoscopes through whose outer shaft extends a shaft or passage for traversal by an optical system and a shaft for traversal by sample-excision forceps.

Endoscopes of the aforesaid nature are known for removal of tissue samples from bodily cavities. If bleeding occurred upon taking samples, in particular upon taking samples from the bladder, this could not stop independently because of the liquid present in the bladder. For this reason until now the excision forceps had to be withdrawn from the endoscope and replaced by a coagulator probe, which was clearly very onerous and time-consuming and particularly since the spot in question, intended to be staunched, had to be sought again after the exchange, requiring considerable time. Whilst doing so, it was sufficient to insulate the forceps shaft by means of a shrunk-on tube installed thereon, since the forceps shaft was in direct contact with the outer shaft or the patient only via a proximal rubber seal.

15 It is an object of the invention to insulate a coagulator-excision pair of forceps generally known in medicine, within an endoscope, against electric shock through the shaft serving the purpose of receiving the optical system or optional ancillary instruments.

20 Accordingly the invention consists in an endoscope, through whose outer shaft extends a shaft or passage for traversal by an optical system and a shaft for traversal by a sample-excision pair of forceps, wherein the actuating rod of the forceps jaws extending through the shaft of the sample-excision forceps and connectible to one terminal of an HF current source is surrounded by an insulating tube which terminates in a rigid, cylindrical, electrically insulating extension of the forceps shaft which acts as a bearing to receive the forceps jaws and the distal end of which projects out of the outer shaft of the endoscope.

Due to this solution, the forceps jaws become usable as a coagulator probe for stopping bleeding actions, and a total insulation is thereby obtained between the parts of the sample-excision forceps which are earthed and carry the HF current, so that unintentional and dangerous passages of current are prevented, since neither the optical system nor ancillary instruments or flushing shafts can come into contact with live parts in view of the insulating extension of the forceps shaft and of the insulating tube shrunk on to the actuating rod of the forceps jaws.

In order that the invention may be more clearly understood reference will now be made to the accompanying drawings which show one embodiment thereof by way of example and in which:—

Figure 1 shows a side view of the endoscope without an outer shaft and without an inserted optical system or ancillary instrument,

Figure 2 shows the distal end, encircled and indicated by II in Figure 1, of the forceps shaft with the forceps jaws in enlarged side view,

Figure 3 shows an axial cross-section through the part of the instrument according to Figure 2.

Referring now to the drawings, the endoscope according to the invention is provided proximally with an insulating element 1 and an HF connector 2 as well as a coupling 3 for an optical system or for ancillary instruments (Figure 1). The outer shaft of the endoscope, which is not illustrated, is to be connected to the cone 4 in known manner.

Through the endoscope extends a shaft 5 for receiving sample-excision forceps comprising a rod 7 which may be operated proximally by means of a handle 6, to which the HF connector 2 is proximally joined in known manner and which is surrounded by an insulating tube 8 throughout its length. A shaft 9 through which an optical system or ancillary instruments may be led interchangeably, extends beside the shaft 5 through the outer shaft.

The forceps shaft 5 terminates distally before the distal end of the outer shaft and is provided with a cylindrical extension 10 of a solid insulating plastics material or other insulating material, in whose distal end acting as a bearer the forceps jaws 11 are immobilised in an inner or outer step. By selection of the material and its shaping, this extension 10 is a mechanically stable extension of the shaft 5. The cylindrical extension 10 projects out of the distal end of the outer shaft of the endoscope, which latter terminates distally approximately at half the length of the extension 10. The proximal end of extension 10 is secured to the distal end of the forceps shaft 5 via a step as shown.

The optical system which is to be inserted or the ancillary instruments which are to be inserted, are protected in the case of a coagulation to be performed against passages of current by the embodiment described, without additional measures being required, meaning that optional available ancillary instruments may be combined with the coagulator-sample-excision forceps 7, 11 without current passages occurring thereon.

### CLAIMS

1. An endoscope, through whose outer shaft extends a shaft or passage for traversal by an optical system and a shaft for traversal by a sample-excision pair of forceps, wherein the actuating rod of the forceps jaws extending through the shaft of the sample-excision forceps and connectible to one terminal of an HF current source is surrounded by an insulating tube which terminates in a rigid, cylindrical, electrically insulating extension of the forceps shaft which acts as a bearing to receive the forceps jaws and the distal end of which projects out of the outer shaft of the endoscope.

2. An endoscope as claimed in claim 1, wherein the cylindrical extension has its proximal end secured to the distal end of the forceps shaft via a step.

3. An endoscope as claimed in claim 1, wherein the forceps jaws are immobilised in an inner or outer step at the distal end of the rigid extension.

4. An endoscope as claimed in claim 1 or 2, wherein the distal end of the outer shaft of the endoscope terminates at approximately half the length of the cylindrical extension.

5. An endoscope substantially as hereinbefore described with reference to the accompanying drawings.

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Printed for Her Majesty's Stationery Office by The Tweeddale Press Ltd.,  
Berwick-upon-Tweed, 1984.  
Published at the Patent Office, 25 Southampton Buildings, London  
WC2A 1AY, from which copies may be obtained.